

CLAIMS:

Sub
P1
5 1. Method for reducing or removing the signs of cutaneous aging, comprising applying onto skin a composition comprising at least one grafted silicone polymer comprising a polysiloxane portion and a portion composed of a non-silicone organic chain, one of the two portions constituting the main chain of the polymer and the other being grafted to the said main chain.

Sub
P2
10 2. Method of tightening the skin comprising applying onto skin a composition comprising at least one grafted silicone polymer comprising a polysiloxane portion and a portion composed of a non-silicone organic chain, one of the two portions constituting the main chain of the polymer and the other being grafted to the said main chain.

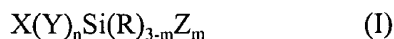
15 3. Method of using in the manufacture of a composition intended to decrease or remove signs of cutaneous ageing, in particular to reduce or remove wrinkles and/or fine lines of the skin and/or to smooth out the skin, of at least one grafted silicone polymer comprising a polysiloxane portion and a portion composed of a non-silicone organic chain, one of the two portions constituting the main chain of the polymer and the other being grafted to the said main chain.

20 4. Method according to any one of Claims 1 to 3, characterized in that said polymer is a polymer with a non-silicone organic backbone grafted by at least one monomer comprising a polysiloxane.

25 5. Method according to Claim 4, characterized in that the said polymer with a non-silicone organic backbone grafted by at least one monomer comprising a polysiloxane is a grafted silicone copolymer comprising:

- a) at least one lipophilic monomer (A) with ethylenic unsaturation which is polymerizable by the radical route;
- b) at least one polar hydrophilic monomer (B) with ethylenic unsaturation which is copolymerizable with the monomer or monomers of the (A) type such that (A) + (B) varies from 99.99% to 50% by weight; and

- c) from 0.01 to 50% by weight of at least one polysiloxane macromer (C) of general formula:



where:

5 X denotes a group with ethylenic unsaturation which is copolymerizable with the monomers (A) and (B);

Y denotes a group with divalent bonding;

R denotes a hydrogen, a hydroxyl group, a C₁-C₆ alkyl or alkylamino or alkoxy group or a C₆-C₁₂ aryl group;

10 Z denotes a polysiloxane unit having a number-average molecular weight of at least 50;

n is 0 or 1 and m is an integer ranging from 1 to 3;

the percentages being calculated with respect to the total weight of the monomers (A), (B) and (C).

15 6. Method according to Claim 5, characterized in that the monomer (A) is chosen from the group composed of n-butyl methacrylate, isobutyl methacrylate, tert-butyl acrylate, tert-butyl methacrylate, 2-ethylhexyl methacrylate, methyl methacrylate, 2-(N-methylperfluorooctanesulphonamido)ethyl acrylate, 2-(N-butylperfluorooctanesulphonamido)ethyl acrylate and their mixtures.

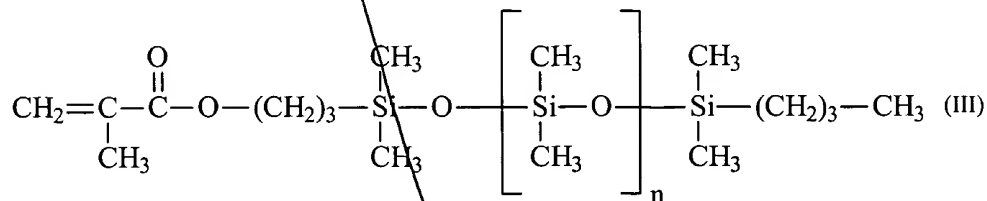
20 7. Method according to Claim 5, characterized in that the monomer (B) is chosen from the group composed of acrylic acid, N,N-dimethylacrylamide, dimethylaminoethyl methacrylate, quaternized dimethylaminoethyl methacrylate, vinylpyrrolidone and their mixtures.

25 8. Method according to Claim 5, characterized in that the polysiloxane macromer (C) has the formula:

with n being a number ranging from 1 to 100.

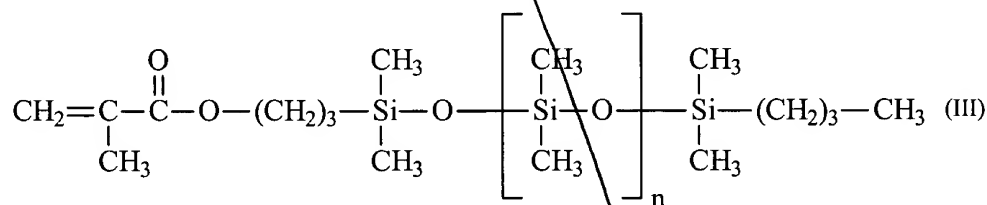
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improper Markush
only stable = Si

9. Method according to Claim 4, characterized in that the said grafted silicone polymer is capable of being obtained by radical polymerization from the mixture of



monomers consisting of:

- a) 60 weight % of tert-butyl acrylate;
- b) 20 weight % of acrylic acid;
- c) 20 weight % of silicone macromer of formula (III):



with n being a number ranging from 1 to 700, the percentages by weight being calculated with respect to the total weight of the monomers.

10. Method according to any one of Claims 1 to 3, characterized in that the said polymer is a polymer with a polysiloxane backbone grafted by at least one non-silicone organic monomer.

11. Method according to Claim 10, characterized in that the said polymer comprises the result of the radical copolymerization between, on the one hand, at least one anionic non-silicone organic monomer exhibiting an ethylenic unsaturation and/or one hydrophobic non-silicone organic monomer exhibiting an ethylenic unsaturation and, on the other hand, a silicone exhibiting, in its chain, at least one functional group capable of reacting with the said

ethylenic unsaturations of the said non-silicone monomers with the formation of a covalent bond.

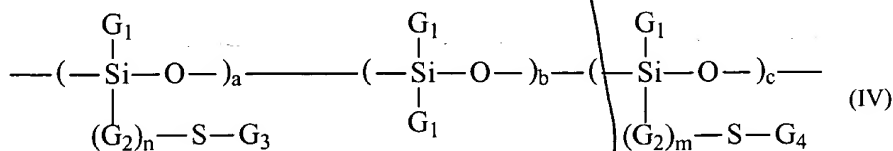
12. Method according to Claim 11, characterized in that the said anionic monomer with ethylenic unsaturation is chosen from linear or branched unsaturated carboxylic acids, optionally partially or completely neutralized in the form of a salt, and their mixtures.

13. Method according to Claim 12, characterized in that the said unsaturated carboxylic acid is chosen from acrylic acid, methacrylic acid, maleic acid, maleic anhydride, itaconic acid, fumaric acid and crotonic acid.

14. Method according to Claim 11, characterized in that the said hydrophobic monomer with ethylenic unsaturation is chosen from alkanol acrylic acid esters and/or alkanol methacrylic acid esters.

15. Method according to Claim 14, characterized in that the said hydrophobic monomer with ethylenic unsaturation is chosen from the group composed of isooctyl (meth)acrylate, isononyl (meth)acrylate, 2-ethylhexyl (meth)acrylate, lauryl (meth)acrylate, isopentyl (meth)acrylate, n-butyl (meth)acrylate, isobutyl (meth)acrylate, methyl (meth)acrylate, tert-butyl (meth)acrylate, tridecyl (meth)acrylate, stearyl (meth)acrylate and their mixtures.

16. Method according to Claim 10, characterized in that the said silicone polymer comprises, in its structure, the unit of following formula (IV):



in which the G_1 radicals, which are identical or different, represent hydrogen or a C_1 - C_{10} alkyl radical or alternatively a phenyl radical; the G_2 radicals, which are identical or different, represent a C_1 - C_{10} alkylene group; G_3 represents a polymer residue resulting from the (homo)polymerization of at least one anionic monomer with ethylenic unsaturation; G_4 represents a polymer residue resulting from the (homo)polymerization of at least one hydrophobic monomer with ethylenic unsaturation; m and n are, independently of one another, equal to 0 or 1; a is an integer ranging from 0 and 50; b is an integer which can be between 10 and 350 and c is an integer ranging from 0 and 50, with the proviso that one of the parameters a and c is other than 0.

17. Method according to Claim 16, characterized in that the said unit of formula (IV) exhibits at least one, and preferably all, of the following characteristics:

- the G_1 radicals denote a C_1 - C_{10} alkyl radical ;
- n is not zero and the G_2 radicals represent a divalent C_1 - C_3 radical;
- G_3 represents a polymer radical resulting from the (homo)polymerization of at least one monomer of the carboxylic acid with ethylenic unsaturation type;
- G_4 represents a polymer radical resulting from the (homo)polymerization of at least one monomer of the (C_1 - C_{10}) alkyl (meth)acrylate type.

18. Method according to Claim 17, characterized in that the said grafted silicone polymer corresponding to the formula (IV) is a polydimethylsiloxane to which are grafted, via a connecting link of thiopropylene type, mixed polymer units of the poly((meth)acrylic acid) type and of the poly(alkyl (meth)acrylate) type.

19. Method according to any one of Claims 1-3, characterized in that the said grafted silicone polymer represents from 0.03 to 25%, preferably from 0.3 to 6%, better still approximately 2%, of the total weight of the said composition.

20. Composition comprising, in a physiologically acceptable medium, at least one grafted silicone polymer comprising a polysiloxane portion and a portion composed of a non-silicone organic chain, one of the two portions constituting the main chain of the polymer and the other being grafted to the said main chain and one or more plant proteins.

Sub
B4

5

10

add
R5
add D³
add E⁴